PRISMA SERIES

Ultrasonic Phased Array Flaw Detector Series

UT

AS SIMPLE AS YOU WANT

- 30 second configuration
- single hand operation
- interactive help & 3D views
- configuration & calibration wizards
- “parameter genius” for additional guidance
- minimize training: common user interface

AS CAPABLE AS YOU NEED

- UT, TOFD & PA inspection modes
- unique cursors for precision measurement
- recordability: screen shots, full data recording, fully traceable
- UT Studio - fast and dynamic reporting
- customized imaging layout.... over 25 to choose from

STEP UP FROM CONVENTIONAL UT TO PHASED ARRAY

Formats available are:

- Prisma UT
- Prisma UT + TOFD
- Prisma UT + PA
- Prisma UT + PA + TOFD
- **upgradeable anytime, anywhere!**

UT *TOFD* *PA*

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TRUE PERFORMANCE TO MEET ALL YOUR INSPECTION REQUIREMENTS

The prisma is the latest product from Sonatest's technician focussed product development and research. An advanced ultrasonic flaw detector offering the technician an extremely comprehensive tool for test and measurement, which can be upgraded to include TOFD and Phased Array capability. An upgrade can be carried out wherever you are, there is no need to return the instrument, eliminating any downtime.

Simple controls, superior performance, advanced features and a rugged enclosure deliver simplicity, capability and reliability to the technician's finger tips.

With the best display size and resolution in it's category, the prisma provides the end user with an intuitive and workflow driven interface, excellent imaging capability uses the Full screen mode allowing 100% of the display to be used for Scan Imaging. Numerous palettes are accessible for all scan types "see things how you want to", in amplitude or depth C-Scans, customise your palettes. Take full advantage of the advanced display modes which include smoothing, contouring and averaging all available to enhance your signal quality.

The prisma is constructed to exacting standards using a rigid, shock mounted, internal chassis surrounded by an impact absorbing enclosure and sealed to IP66; which ensures the unit is fully sealed against fine dust and jets of water.

Typical applications are broad but include Weld Inspection, Corrosion Mapping, Aerospace and Composite Testing.

PRISMA UT

The Prisma UT model is fully loaded, carrying all the basic and advanced features of the Sonatest flaw detector range. Prisma UT offers damping control to either optimize near surface resolution or energy transmission. The ability to capture screens is standard combined with automatic reporting capability which enables reports to be formatted with relative bespoke customer information such as logos etc. The most popular flaw sizing techniques such as DAC, AVG/ DGS, TGC and AWS are all on-board.

Thanks to the on-board software enhancing the B and C-Scan imaging capabilities, the Prisma UT enables field technicians to conduct dedicated corrosion and composite inspections, together with comprehensive on-site thickness profiling.

PRISMA TOFD

Ultrasonic Time of Flight Diffraction (TOFD) has gained in popularity over the last decade and via the Prisma TOFD, Sonatest brings to the market a truly portable and powerful TOFD unit. Knowing that TOFD inspection can be carried out on wall thickness as thin as 6mm (1/4”), the Prisma offers the best digitizing frequency of its category going up to 200MHz. Simply put this means that high frequency transducers can be used, ensuring the most accurate flaw height sizing possible.

TOFD is a versatile technique; with two UT channels the Prisma permits the inspection of thick component in a single pass. This is enhanced by the high voltage square wave pulsers delivering up to 450V.

Prisma TOFD offers the complete hardware configuration to deliver the best performance, but it would be incomplete without the on-board software features such as hyperbolic cursors, lateral wave straightening and lateral wave removal. S, True Top, Side and End view extractions, together with C-Scans, are all supported.

PRISMA PA

Ultrasonic Phased Array technology has become the established method for advanced NDT testing applications. Phased Array Techniques allow the user to cover a wider volume of inspection; such as being able to cover the complete span of a weld without the need to move or reposition the transducer. This is possible due to phased array enabling beams to be electronically steered. This technique results in comprehensive imaging of the results showing a quasi cross section of the inspected part.

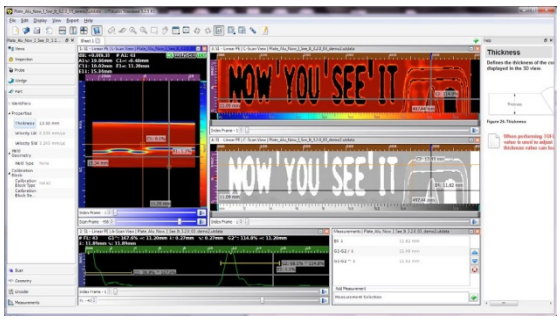
With the Prisma PA you can switch easily and quickly between the UT and PA operating modes with a simple press of a button, no data or time is lost.

The Inspection Plan shows the operator in 2D and 3D where probes are positioned on the test part, simplifying the inspection set up and providing an inspection reference for reporting. All adjustments to focal laws are instantaneous. Multiple sectorial scans, true top,side and end view extractions, together with C-Scans, are all supported.

UT STUDIO

UT Studio is a PC based software, which accompanies the Prisma and enables powerful post analysis capability. Not only does it offer excellent report generation features but new views can be generated and comparative analysis can be conducted by opening multiple inspection data files, re-gating and producing fully illustrated reports. Working in a familiar “drag and drop” environment the end user can create multiple views such a Top, End and BScan visual files by simply dragging Prisma data files onto templates for presentations.

Full recordability of data when using the Prisma is standard, which means that screenshots and all data can be retained and analyzed at a later date using UT Studio. IN using the full data gathering capability traceability can be achieved; hence repeatability of the inspection and results can be confirmed.



Powerful measurement cursors and extractors can be added to identify indications, size and annotate defects. Reports are easily generated and can be exported into PDF format for review and circulation.

Free downloads of UT Studio Viewer are available for the technician’s client to use.

SPECIFICATION

	Conventional UT	Phased Array
PULSERS		
Configuration	▪ 2 UT channels	▪ 16:16 or 16:64
Test Mode	▪ Pulse-Echo, transmit/receive and TOFD	▪ Pulse-Echo, transmit/receive
Transducer Socket	▪ LEMO 1 or BNC	▪ I-PEX
Pulse Voltage	▪ -100 V to -450 V (in steps of 10 V)	▪ -25 V to - 75 V (in steps of 5 V)
Pulser	▪ pulse width adjustable from spike to 2000ns (2.5ns resolution)	▪ pulse width adjustable spike to 1000ns (2.5ns resolution)
PRF	▪ 3 Hz to 5 kHz	▪ 3 Hz to 5 kHz
Pulse Shape	▪ negative square wave (with ActiveEdge)	▪ negative square wave (with ActiveEdge)
Pulse Width	▪ adjustable: 25ns to 2000ns (2.5 ns resolution)	▪ adjustable: 25ns to 1000ns (2.5 ns resolution)
Edge Time	▪ 15 ns in 50 Ω load @200 V	▪ 12 ns in 50 Ω load @50 V
Output Impedance	▪ 5 Ω	▪ <10 Ω
Synchronisation	▪ encoder or free-running (time based)	▪ encoder or free-running (time based)
Focus Delay Range	▪ n/a	▪ 0 to 10 µs (2.5 ns resolution)
Damping Resistor	▪ selectable: 50 Ω or 400 Ω	▪ n/a
RECEIVERS		
Gain Range	▪ 120 dB (-40 dB to 80 dB), Analogue Gain	▪ 0 to 80 dB (0.1 dB steps), Analogue Gain
Max Input Voltage	▪ 25 Vp-p	▪ 200 mVp-p
Input Impedance	▪ 1 kΩ (pitch and catch)	▪ 200 Ω
Bandwidth	▪ 200 kHz to 22 MHz (-3 dB)	▪ 200 kHz to 14 MHz
Analog Filters	▪ 4	▪ 3
Digital Filters	▪ 10	▪ 10
Rectification	▪ full wave, positive, negative, none (RF)	▪ full wave, positive, negative, none (RF)
Single Enhancement	▪ digital filters, averaging, smoothing, contouring	▪ digital filters, smoothing
Focus Delay Range	▪ n/a	▪ 0 to 10ns (16 ns resolution interpolated to 3.8 ns)
DATA ACQUISITION		
Architecture	▪ 2 channels, true 200 MHz sampling rate	▪ 16 channels, full digital delay & sum
Digitizer Resolution	▪ 12 bit ADC	▪ 12 bit ADC
Amplitude Measurement	▪ [0% to 100%] or [0% to 150%] FSH	▪ [0% to 100%] or [0% to 150%] FSH
Data Processing	▪ 16 bits/sample	▪ 16 bits/sample
Data Recording	▪ full raw data recording	▪ full raw data recording
File Size	▪ up to 3 GB	▪ up to 3 GB
Digitizing Frequency	▪ 50 MHz, 100 MHz, 200 MHz	▪ 65 MHz
Focal Laws	▪ n/a	▪ 128
Focussing Type	▪ n/a	▪ constant depth, constant path, constant offset
Max A-Scan Length	▪ 8192 samples	▪ 4096 samples
Sub-Sampling	▪ 1:1 to 1:128	▪ 1:1 to 1:128
Reference	▪ initial pulse or Gate/IFT supported	▪ Initial Pulse or Gate/IFT supported
Trigger Sync.	▪ encoder or Internal	▪ encoder or Internal
SCAN & VIEWS		
Supported Scans	▪ A-Scan & TOFD	▪ S-Scan or L-Scan
Number of Scans	▪ up to 4	▪ 1 (with up to 4 extracted A-Scans)
Views	▪ A, B, C-Scan plus TOFD	▪ A, B, C, L, S-Scan plus End & Top view
Colour Maps	▪ up to 10	▪ up to 10
Number of Layouts	▪ 12	▪ 17
CURSORS		
Cursor Types	▪ cartesian, hyperbolic (TOFD)	▪ cartesian, extraction box, angular
Measurements	▪ path length, depth, surface distance, DAC, AWS, DGS	▪ path length, depth, surface distance, DAC, AWS

	Conventional UT	Phased Array
DAC & TCG		
DAC points	▪ 16	▪ 16
DAC	▪ 1 with 3 “sub DACs”	▪ 1 with 3 “sub DACs” per focal Law
TCG points	▪ 16	▪ 16
Gain Range	▪ 60 dB	▪ 40 dB
Max Gain Slope	▪ 60 dB/µs	▪ 50 dB/µs
GATES		
A-Scan Gates	▪ 4 gates per A-Scan	▪ 4 gates per A-Scan ▪ (3 extracted A-Scans per S/L-Scan)
Gate Trigger	▪ flank/peak	▪ flank/peak
S/L-Scan	▪ n/a	▪ 1 Extraction Box
Alarm LED	▪ 1 (sync on all gates & DACs)	▪ 1 (sync on all gates & DACs)
Measurements (A-Scan)	▪ peak & flank (FSH, dB, D, BPL, SD) and Echo-to-Echo	▪ peak & flank (FSH, dB, D, BPL, SD) and Echo-to-Echo
INTERFACE & REPORTING		
Help System	▪ active parameter description and optimization tips	
Configuration Validation	▪ dynamic help with parameter genius	
Wizards	▪ configuration, velocity and zero, wedge delay, sensitivity, TCG, DAC, DGS, element activation, encoder	
Languages (dynamic)	▪ English, German, French, Spanish, Russian, Chinese	
Report Generation	▪ PDF File (includes scans, setup, measurements, etc.), PNG screen capture, customer Logo	
PDF Reader	▪ allows viewing any uploaded PDF file	
INPUTS & OUTPUTS		
Encoder	▪ 1 or 2 axis encoding (quadrature input)	
Digital Inputs	▪ 2 input lines (5V TTL)	
Digital Outputs	▪ 2 output lines (5V TTL, 20 mA) for alarm or other external control	
Analogue Outputs	▪ 2 analogue output lines (0-2V)	
Power Output	▪ 5V, 350 mA, current limited	
ENCLOSURE		
Dimensions (HxWxD)	▪ 205mm x 300mm x 90 mm	
Weight	▪ 3.5 kg (with battery)	
Display Size	▪ 8.4 inch (diagonal)	
Display Resolution	▪ 800 x 600	
Display Colours	▪ 260k (65535 colours for scan palettes)	
Display Type	▪ TFT LCD, 450 Cd/m2, with 2% reflectivity	
USB ports	▪ 3 USB master ports	
Ethernet	▪ 100 Mbps	
BATTERY & POWER SUPPLY		
Battery Type	▪ intelligent Li-ion	
Number of batteries	▪ 1	
Operation	▪ on battery or on external power (DC Power Pack)	
Battery Replacement	▪ yes, no tools required	
Battery Recharge	▪ recharge in unit (with unit On or OFF) - external battery charger (std)	
Battery Life	▪ typical: 7 hours in UT mode, 6 hours in PA mode	
ENVIRONMENTAL		
IP Rating	▪ designed to meet IP66	
Operating Temperature	▪ -10 °C to 45 °C (14 °F to 113 °F)	
Storage Temperature	▪ -25 °C to 60 °C (-13 °F to 140 °F)	

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PRISMA UT STANDARD KIT

Dual UT Channels with:

- A-Scan Recording
- 2 Axis Encoding
- Interface Triggering (IFT)
- A,B and C scan displays
- USB Stick (8GB)
- couplant
- user manual/ quick user guide
- 2 point neck harness
- lithium-Ion battery packs (x2) external battery charger
- power cord & power supply adaptor
- screen protector (anti-glare)
- transport case (airplane carry on size)

PRISMA UT/PA 16/16 STANDARD KIT

- Dual UT channel kit above plus
- 16:16, manual PA

OPTIONS

UT option

- TOFD
- *encoding for UT is standard
- *IFT for UT is standard

PA option

- 16:64
- 2 axis encoding & recording for PA IFT for PA
- encoder Y-Splitter

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